



Personal LaserWriter 320
User's Guide

.....

Printer



Be Leipzig

Personal LaserWriter 320
User's Guide

Apple
Printer

Apple Computer, Inc.

This manual and the software described in it are copyrighted by Apple, with all rights reserved. Under the copyright laws, this manual or the software may not be copied, in whole or in part, without the written consent of Apple, except in the normal use of the software or to make a backup copy of the software. The same proprietary and copyright notices must be affixed to any permitted copies as were affixed to the original. This exception does not allow copies to be made for others, whether or not sold, but all of the material purchased (with all backup copies) may be sold, given, or loaned to another person. Under the law, copying includes translating into another language or format.

You may use the software on any computer owned by you, but extra copies cannot be made for this purpose.

The Apple logo is a trademark of Apple Computer, Inc., registered in the U.S. and other countries. Use of the “keyboard” Apple logo (Option-Shift-K) for commercial purposes without the prior written consent of Apple may constitute trademark infringement and unfair competition in violation of federal and state laws.

Every effort has been made to ensure that the information in this manual is accurate. Apple is not responsible for printing or clerical errors.

© 1993 Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014-6299
(408) 996-1010

Apple, the Apple logo, AppleTalk, LaserWriter, LocalTalk, and Macintosh are trademarks of Apple Computer, Inc., registered in the U.S. and other countries. Finder, FinePrint, Geneva, PhotoGrade, and TrueType are trademarks of Apple Computer, Inc.

Adobe, Adobe Illustrator, Adobe Photoshop, and PostScript are trademarks of Adobe Systems Incorporated, which may be registered in certain jurisdictions.

Exposure is a registered trademark of Preferred Publishers, Inc.

Helvetica, Palatino, and Times are registered trademarks of Linotype Company.

ITC Avante Garde, ITC Bookman, ITC Zapf Chancery, and ITC Zapf Dingbats are registered trademarks of International Typeface Corporation.

QMS is a registered trademark of QMS, Inc.

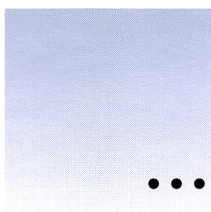
QuarkXPress is a registered trademark of Quark, Inc.

SuperPaint is a registered trademark of Aldus Corporation.

Tektronix is a registered trademark of Tektronix, Inc.

Simultaneously published in the United States and Canada.

Mention of third-party products is for informational purposes only and constitutes neither an endorsement nor a recommendation. Apple assumes no responsibility with regard to the performance or use of these products.



Radio and television interference	v
1 Setting Up Your Printer	1
Main features of the Personal LaserWriter 320	2
Important safety instructions	3
Choosing a location for the printer	4
Connecting the printer to your Macintosh	5
Installing the toner cartridge	7
Putting in paper	10
Plugging in and turning on the printer	13
Installing your printer software	15
Telling your Macintosh to use the Personal LaserWriter 320	17
Trying out the printer	19

2	Printing	21
	Choosing face-down or face-up delivery	22
	Defining the page setup	23
	Printing a document	24
	Printing complex documents	25
	Printing a document with FinePrint or Photograde	25
	Printing paper or envelopes with the manual feed slot	27
	Printing on both sides of a page	29
	Using the LaserWriter Utility program	30
3	Maintaining Your Printer	39
	Replacing the toner cartridge	40
	Cleaning the exterior	40
4	Tips and Troubleshooting	41
	Safety precautions	42
	Checking the printer's status lights	43
	Solving some common problems	44
	About paper	52
Appendix A	Upgrading Your Printer's Memory	53
Appendix B	Built-in fonts	57
Appendix C	Technical Information	59
	Index	63

Important

This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in Part 15 of FCC rules. See instructions if interference to radio or television reception is suspected.

Radio and television interference

The equipment described in this manual generates, uses, and can radiate radio-frequency energy. If it is not installed and used properly—that is, in strict accordance with Apple's instructions—it may cause interference with radio and television reception.

This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in Part 15 of FCC rules. These specifications are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

You can determine whether your computer system is causing interference by turning it off. If the interference stops, it was probably caused by the computer or one of the peripheral devices.

If your computer system does cause interference to radio or television reception, try to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.
- Move the computer to one side or the other of the television or radio.
- Move the computer farther away from the television or radio.
- Plug the computer into an outlet that is on a different circuit from the television or radio.
(That is, make certain the computer and the television or radio are on circuits controlled by different circuit breakers or fuses.)

If necessary, consult an Apple-authorized service provider or Apple. See the service and support information that came with your Apple product. Or, consult an experienced radio/television technician for additional suggestions. You may find the following booklet helpful: *Interference Handbook* (stock number 004-000-00493-1). This booklet, prepared by the Federal Communications Commission, is available from the U.S. Government Printing Office, Washington, DC 20402.

Important

Changes or modifications to this product not authorized by Apple Computer, Inc., could void the FCC Certification and negate your authority to operate the product.

This product was tested for FCC compliance under conditions that included the use of Apple peripheral devices and Apple shielded cables and connectors between system components. It is important that you use Apple peripheral devices and shielded cables and connectors between system components to reduce the possibility of causing interference to radios, television sets, and other electronic devices. You can obtain Apple peripheral devices and the proper shielded cables and connectors through an Apple-authorized dealer. For non-Apple peripheral devices, contact the manufacturer or dealer for assistance.

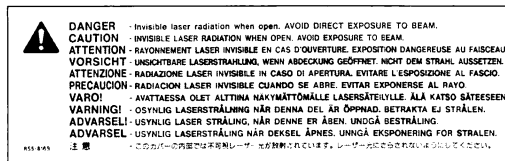
DOC Class B Compliance This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the radio interference regulations of the Canadian Department of Communications.

Observation des normes—Classe B Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Classe B prescrites dans les règlements sur le brouillage radioélectrique édictés par le Ministère des Communications du Canada.

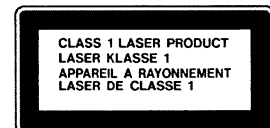
WARNING Making adjustments or performing procedures other than those specified in your equipment's manual may result in hazardous exposure.

WARNING Do not attempt to disassemble the cabinet containing the laser. The laser beam used in this product is harmful to the eyes. The use of optical instruments, such as magnifying lenses, with this product increases the potential hazard to your eyes. For your safety, have this equipment serviced only by an Apple-authorized service provider.

This printer is a Class 1 laser product. It carries a Class 1 label underneath the printer and a service warning label inside the printer.



Service warning label



Class 1 label

1

Setting Up Your Printer



This chapter introduces the Personal LaserWriter 320 printer and explains how to set it up. After you follow the instructions in this chapter, you'll be ready to print.

In this chapter

- Main features of the Personal LaserWriter 320
- Important safety instructions
- Choosing a location for the printer
- Connecting the printer to your Macintosh
- Installing the toner cartridge
- Putting in paper
- Plugging in and turning on the printer
- Installing your printer software
- Telling your Macintosh to use the Personal LaserWriter 320
- Trying out the printer

Main features of the Personal LaserWriter 320

- PostScript™, a technology that allows for precise printing of fonts and pictures, is built in to the printer.
- An energy conservation feature turns the printer on and off automatically. The printer shuts off most of its functions when they aren't in use and “wakes up” automatically when you print a document.
- Printed images can have more than 90 levels of gray.
- A collection of 35 PostScript fonts built in to the printer provides a large selection of typefaces for business, desktop publishing, and graphics needs.
- FinePrint smooths lines and curves that would otherwise appear jagged.
- PhotoGrade, available on printers with 8 MB of memory, prints lifelike images by allowing you to control the number of levels of gray.
- A LocalTalk port on the printer allows everyone on your AppleTalk network to share the printer.

Important safety instructions

Always take the following precautions:

- Keep the printer away from sources of liquids, such as wash basins, bathtubs, shower stalls, and so on.
- Protect the printer from dampness or wet weather, such as rain, snow, and so on.
- Read all the installation instructions carefully before you plug the printer into a wall socket.
- Keep these instructions handy for reference by you and others.
- Follow all instructions and warnings dealing with your system.
- Don't use devices that produce open flames, such as Bunsen burners, near the printer.
- Don't use alcohol-based or ammonia-based cleaners on or around the printer.
- Clean the printer with only a damp cloth and, if necessary, a mild soap or detergent. Be careful to avoid getting liquid in the printer or the power cord receptacle.

Disconnect the power plug immediately if any of the following situations occur:

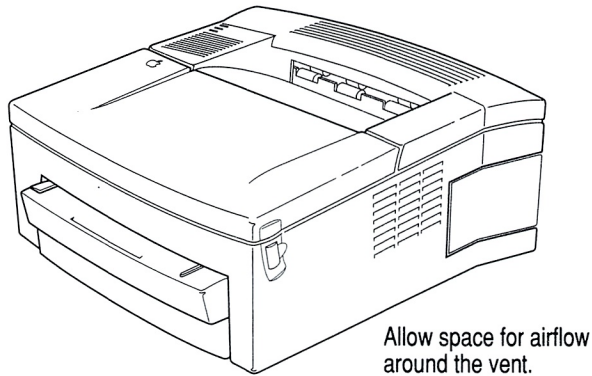
- the power cord or plug becomes frayed or otherwise damaged
- you spill something into the case
- the printer is exposed to rain or any other excess moisture
- the printer has been dropped or the case has been otherwise damaged
- you suspect that your printer needs service or repair
- you want to clean the case (use only the recommended procedure described in Chapter 3)

WARNING Electrical equipment may be hazardous if misused. Operation of this product, or similar products, must always be supervised by an adult. Do not allow children access to the interior of any electrical product and do not permit them to handle any cables.

Choosing a location for the printer

Choose a flat, stable surface with adequate room around the printer. The area should be well ventilated and away from direct sunlight or sources of heat, cold, or humidity. When choosing a location, also take into account the information in the next section, “Ozone Emission.”

Allow 4 inches (10 cm) at the back of the printer for airflow.



IMPORTANT Don't plug in the printer yet! Wait until you finish setting up the printer (including connecting the cables and putting in the paper) as described in this chapter. Unless everything is ready when you plug the printer in, the printer may jam when it tries to print the startup page.

Ozone emission

Ozone gas is emitted by almost all laser printers and photocopiers. Because ozone can be an irritant, various regulatory agencies have established limits regarding the amount of ozone to which employees may be exposed.

The current OSHA permissible limit for ozone is 0.1 parts of ozone per million parts of air (ppm). The Personal LaserWriter produces unmeasurable quantities of ozone, far below the current limit specified by OSHA.

To minimize ozone exposure, install the LaserWriter in a well-ventilated area. If there are other laser printers or photocopy machines in the same area, additional air circulation may be required. Do not place the LaserWriter in a small, enclosed space that lacks adequate ventilation. Position the printer so that the fan exhaust does not blow directly into anyone's face.

Connecting the printer to your Macintosh

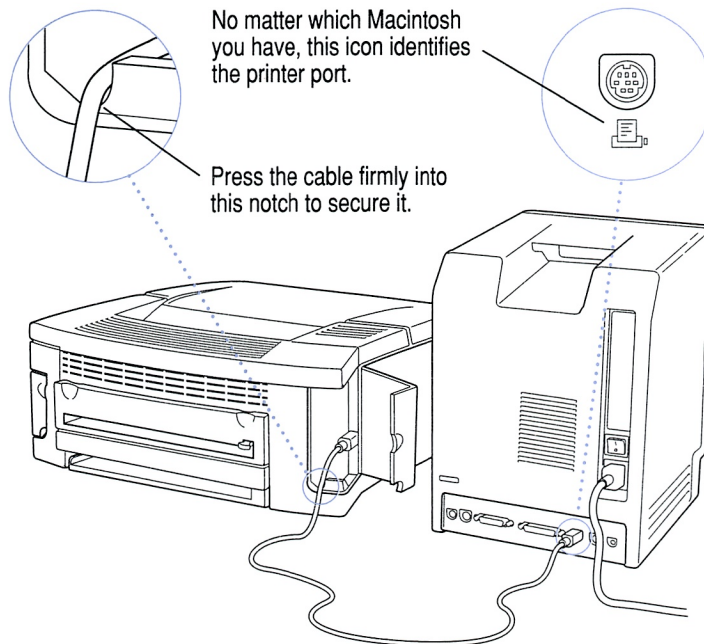
You can connect the Personal LaserWriter 320 to your Macintosh directly, or over an AppleTalk network, as explained in the next two sections.

Connecting directly to your Macintosh

If your Macintosh isn't connected to a network, you can connect the printer directly to your computer. (If your computer is connected to a network, skip to the next section now.)

Note Even though the printer and the computer are connected by a simple cable, technically this arrangement still counts as a network, albeit a very small one.

- 1 Make sure you have a Peripheral-8 cable on hand.**
- 2 Plug one end into the LocalTalk port on the printer and the other end into the printer port on the back of the Macintosh.**



- 3 Skip the next section and go to “Installing the Toner Cartridge” later in this chapter.**

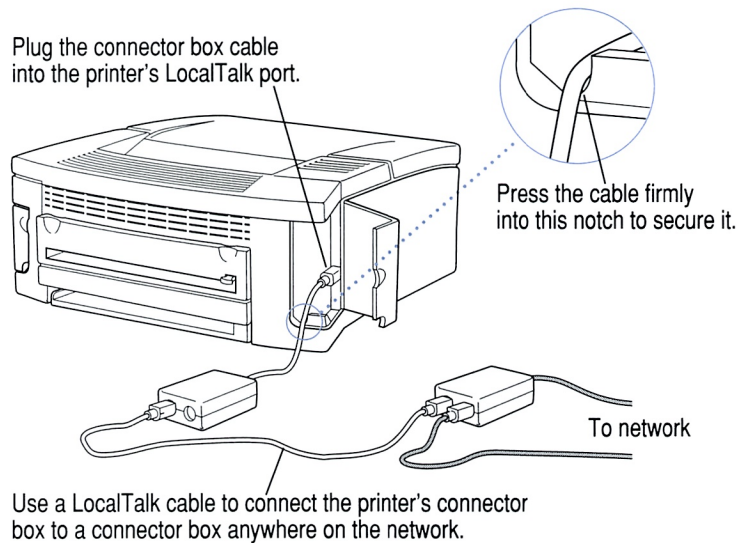
Connecting over an AppleTalk network

If your Macintosh is already connected to a network, connect the printer to the network too. Every Macintosh on the network can print on the printer.

Note Everyone on the network who wishes to use the Personal LaserWriter 320 must install the printer software and choose the printer as described in “Telling Your Macintosh to Use the Personal LaserWriter 320” later in this chapter.

Before you begin If you already plugged in the printer, unplug it now.

- 1 Make sure you have a LocalTalk connector box and a LocalTalk cable.**
- 2 Connect the cables as shown here:**

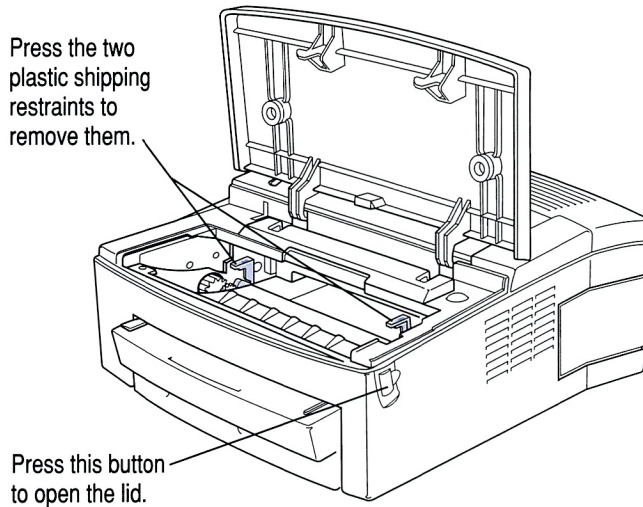


Installing the toner cartridge

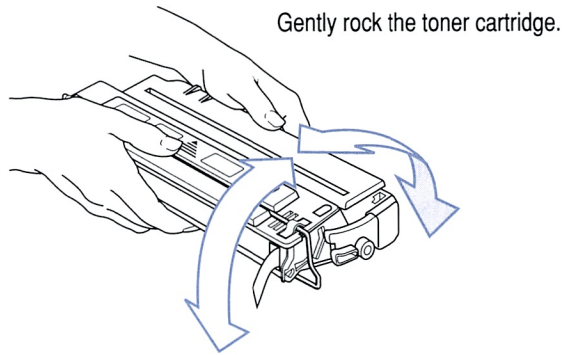
Toner is the powdered ink that produces the image on the paper. Follow these steps to install a toner cartridge in the printer for the first time.

1 Open the printer lid.

If you're installing a toner cartridge for the first time, remove the colored plastic shipping inserts, as shown in the picture. If you're replacing a toner cartridge, remove the old cartridge.



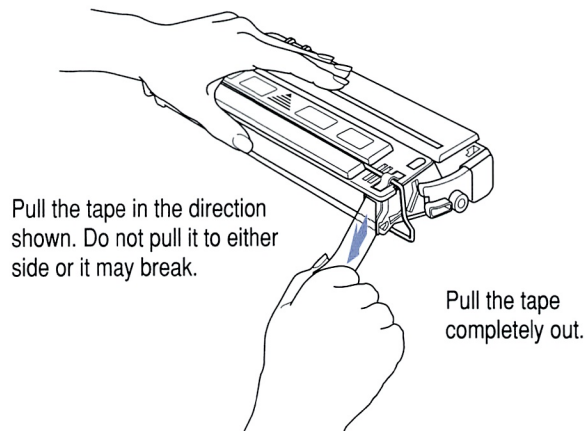
2 Unpack the toner cartridge and gently rock it to distribute the toner inside.



Save the protective bag. If you move or transport your printer, you will need to remove the cartridge and transport it separately in the bag.

Don't expose the cartridge to direct sunlight. Don't expose it to room light for more than five minutes, or the life of the cartridge may be reduced.

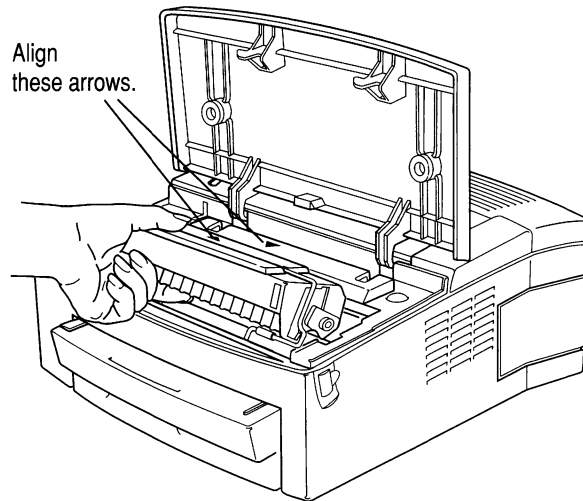
3 Pull the tab to remove the tape.



WARNING Be sure to pull the tape in the direction shown. Don't pull it too quickly or at too sharp an angle; otherwise, the tape may break.

4 Insert the cartridge into the printer.

Line up the markings on the sides of the cartridge with the arrows in the printer.



5 With both hands, press down gently on the cartridge to secure it in place.

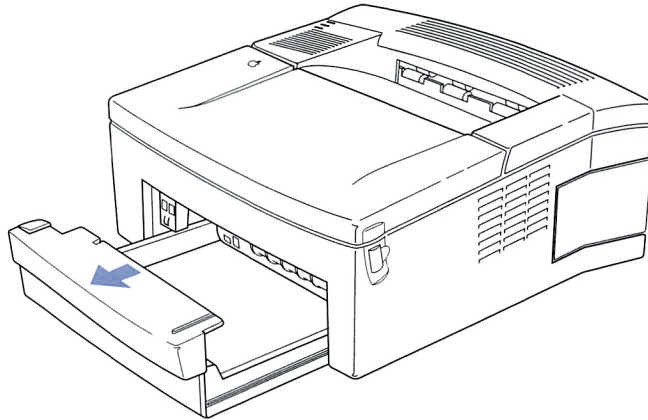
6 Close the printer lid.

Putting in paper

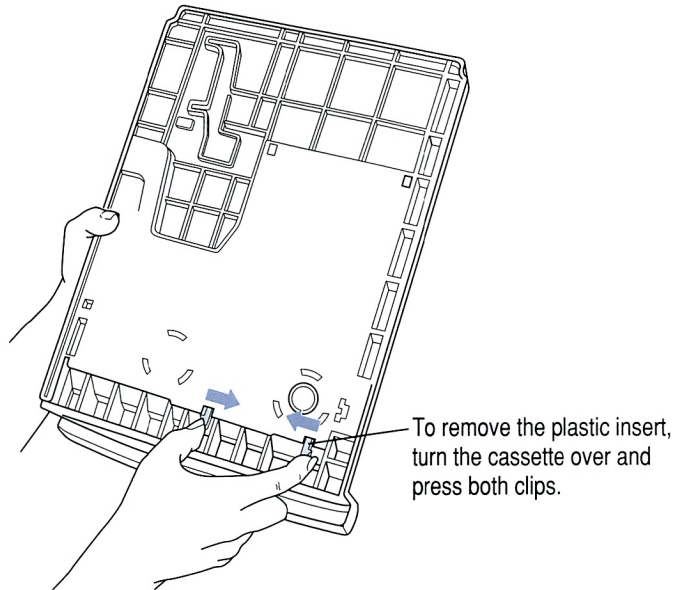
You can put up to 100 sheets of copier-weight bond paper into the paper cassette supplied with your printer. You can use the following sizes: U.S. Letter, A4, B5, U.S. Legal, or Executive. For advice on paper quality, see Chapter 4, “Tips and Troubleshooting.”

To load the paper cassette:

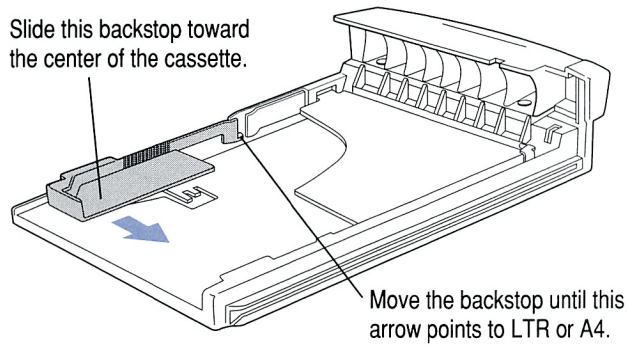
- 1 Pull the cassette out of the printer and place it on a flat surface.**



- 2 Before loading the cassette for the first time, remove the orange cardboard and plastic shipping inserts.**



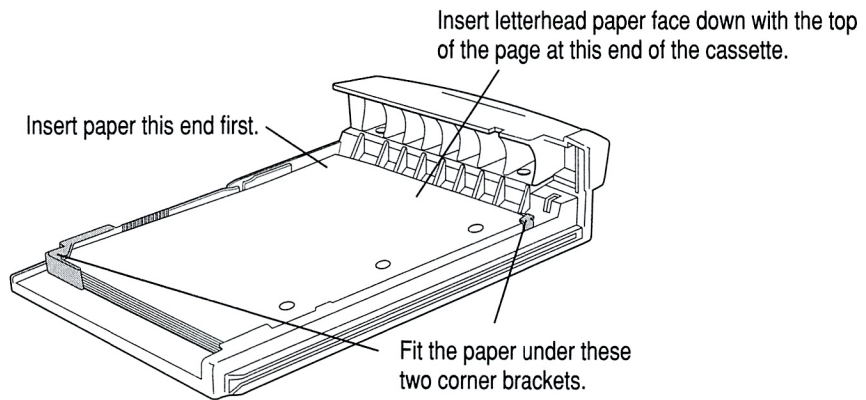
- 3 Adjust the cassette for your paper. Always load Letter or A4 paper into the cassette just before you plug in the printer.**



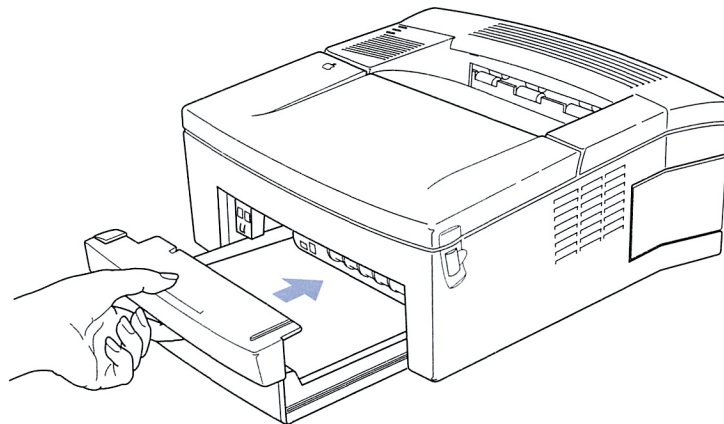
Make sure the backstop is in one of the notches. If you set it between notches you may cause a printing error.

Note You must put in Letter or A4 paper before you plug in the printer, so it can print its startup page. You can switch to another paper size later.

- 4** Insert a stack of paper under the brackets. If you use 3-hole paper, line up the holes as shown:



- 5** Slide the cassette back into the printer.



Push firmly to make sure the cassette is in place.

Plugging in and turning on the printer

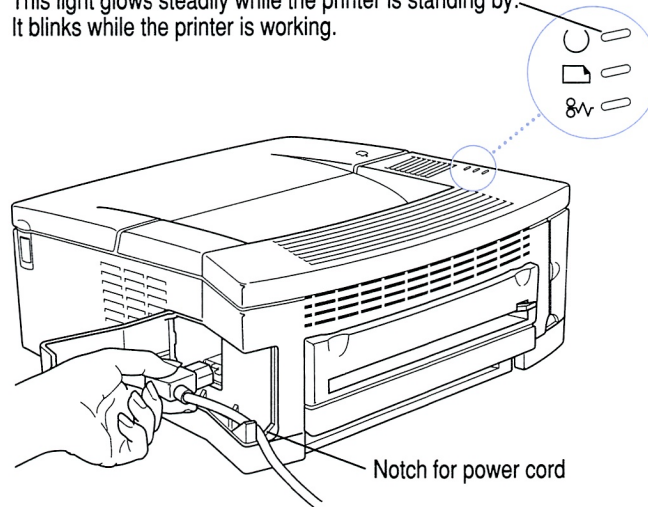
The Personal LaserWriter 320 printer has no on/off switch. As soon as it is plugged in, the power is on and the printer is standing by, ready to print. To save energy, the printer turns off most of its functions when they're not being used. As soon as it detects something to be printed, the printer “wakes up” and goes to full power.

The Personal LaserWriter 320 is intended to be plugged in and on standby continuously. There is no need to unplug it, except to maintain it or move it. When it's standing by, the printer consumes very little energy—less than 10 watts, about the same as a night-light.

Before you begin Make sure you have installed the paper and toner cartridge and connected the printer to your Macintosh.

1 Attach the power cord to the printer as shown:

This light glows steadily while the printer is standing by. It blinks while the printer is working.



IMPORTANT The only way to disconnect power completely is to unplug the power cord. Make sure at least one end of the power cord is within easy reach so that you can unplug the LaserWriter when you need to.

2 Plug the other end of the power cord into the wall

WARNING The Personal LaserWriter 320 is equipped with a three-wire grounding plug—a plug that has a third (grounding) pin. This plug will fit only a grounded AC outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact a licensed electrician to replace the outlet with a properly grounded outlet. Do not defeat the purpose of the grounding plug!

3 Wait for the startup page to print.

When you plug the power cord into an outlet, the green Ready/In Use light comes on. After a few moments the light begins to blink, and a little while later the startup page prints.

If you inserted A4 paper into the paper tray, an amber light may start to glow on the printer after the startup page prints. To reset the light, remove and replace the paper tray.

Installing your printer software

The Personal Laserwriter 320 comes with several disks that contain the printer software and a program called the Installer that copies the software onto your hard disk. Follow the steps in this section to install the software.

IMPORTANT If your Macintosh has System 6, installing the LaserWriter 8 driver places new versions of PrintMonitor and Backgrounder in your System Folder. The new versions of PrintMonitor and Backgrounder may not work with earlier versions of the LaserWriter driver using System 6. If you intend to use an earlier version of the LaserWriter driver again, make copies of the System 6 versions of PrintMonitor and Backgrounder before starting this section and keep them for use with the older LaserWriter driver.

Before you begin Lock all four disks by turning each one over and sliding the small, square plastic tab so you can see through the hole.

- 1 Insert the **Personal LaserWriter 320 Installation** disk into a floppy disk drive.

The disk's icon appears on the desktop, as shown in the next step.

- 2 Double-click the disk icon to see what's on the disk.



- 3 Double click the Installer icon to start the Installer program.



After a moment, the Installer displays information about what will be installed.

IMPORTANT The Installer checks to make sure you have the correct system software and enough Macintosh memory to use this printer. If not, it displays a message telling you what you need. You won't be able to install the software until you correct the problem. If it says you don't have the correct system software, you can purchase a new version from your Apple-authorized dealer.

- 4 After you read the information on the screen, click OK.
- 5 Click the Install button.



The Installer takes a few minutes to calculate what needs to be done and then begins to copy files.

- 6 When the Personal LaserWriter 320 disk is ejected, follow the instructions on your screen.

The Installer will eject disks and ask you to insert others. Keep following the instructions on the screen until the installation is complete.

More information about the Installer program

The procedure described above copies all the software you need onto your hard disk. In very rare circumstances, you may want to copy only a subset of the software. In that case, click the Customize button in the Installer to see a list of choices, then click a choice to see a description of it. To install something in the list, click to select it, then click the Install button.

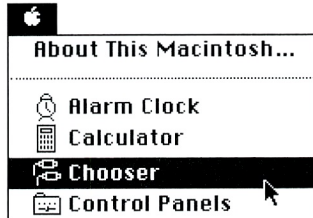
Telling your Macintosh to use the Personal LaserWriter 320

Before you use your Personal LaserWriter 320 for the first time, you must select it in the Macintosh Chooser.

IMPORTANT If you have upgraded your printer so it has more than 2 MB of memory, skip this section and turn to Appendix A, “Upgrading Your Printer’s Memory,” instead. (The instructions there completely replace the instructions in this section.) You can tell how much memory your printer has by looking at the startup page you just printed.

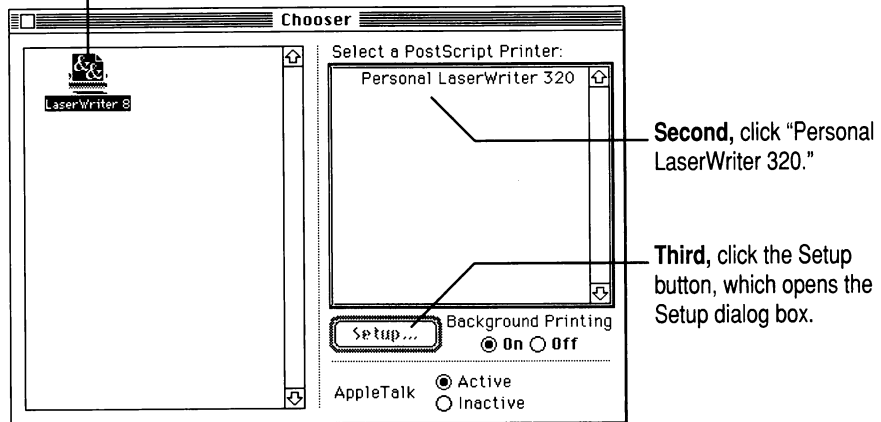
Before you begin Make sure the printer is plugged in, your computer is turned on, and the printer is connected to your Macintosh.

- 1 Open the Chooser by pulling down the Apple (🍏) menu and selecting Chooser.



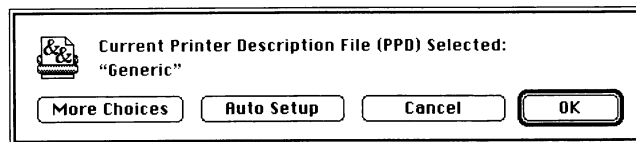
2 Click items in the Chooser as follows:

First, click the LaserWriter 8 icon. (If you don't see it, click the scroll arrows. There may be a number of other icons here.) After a moment, your printer's name appears in the box to the right.



3 In the Setup dialog box, click Auto Setup.

Your Setup dialog box may have more buttons than this.



The Macintosh displays messages on your screen while it selects the correct Printer Description file.

4 Click OK to return to the Chooser.

A small icon now appears next to the name of your Personal LaserWriter 320 in the Chooser.

5 Close the Chooser by clicking its close box (in the top-left corner).

Trying out the printer

The best way to see if your printer is set up correctly is to try printing something. You can print any document you want, or if you don't know how to print yet, follow these steps:

Before you begin Return to the Finder by quitting any programs you're running.

- 1 Insert the **Personal LaserWriter 320 Installation** disk into a floppy disk drive.

The disk's icon appears on the desktop, as shown in the next step.

- 2 Double-click the disk icon to see what's on the disk.



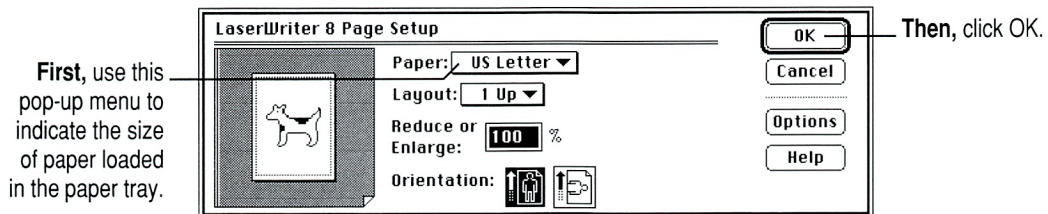
- 3 Double-click the Read Me icon to open the Read Me document.



- 4 Pull down the File menu and choose the Page Setup command.

A dialog box opens.

- 5 Indicate what paper size you're using.

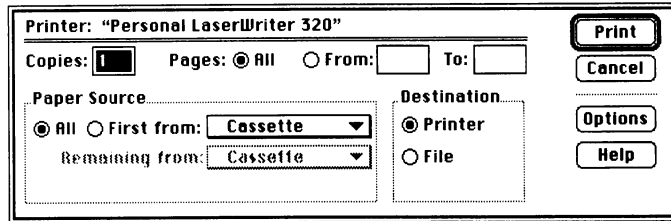


You don't need to choose the Page Setup command every time you print—you need to use it only when you want to change the normal settings.

- 6 Pull down the File menu and choose the Print command.

A dialog box opens.

- 7 Click the Print button.



For information about all the choices you can make in the Print dialog box, see Chapter 2.

- 8 Pull down the File menu and choose Quit to leave the Read Me file.
- 9 Eject the disk by dragging its icon to the Trash.
- 10 Watch the printer to see what happens.

If everything is working correctly, the green printer light will begin to blink. After a few moments, the printed page or pages will come out of the printer. If there's a problem, see Chapter 4 for suggestions.

2

Printing



This chapter explains how to print documents on a Personal LaserWriter 320 printer and how to use the LaserWriter Utility program. More printing instructions can be found in the manuals for your application programs.

Before you use the printer, you should have set up the printer and installed the software as described in Chapter 1.

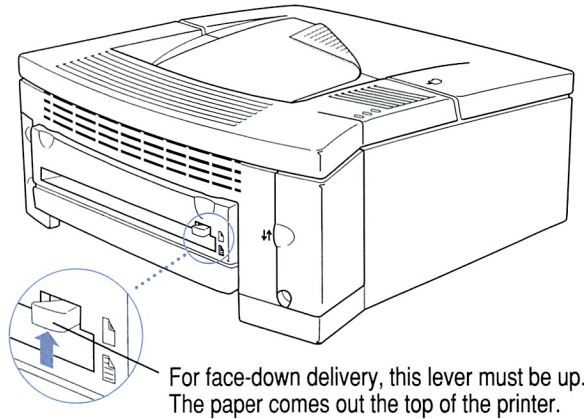
In this chapter

- Choosing face-down or face-up delivery
- Defining the page setup
- Printing a document
- Printing complex documents
- Printing a document with FinePrint or PhotoGrade
- Printing paper or envelopes with the manual feed slot
- Printing on both sides of a page
- Using the LaserWriter Utility program

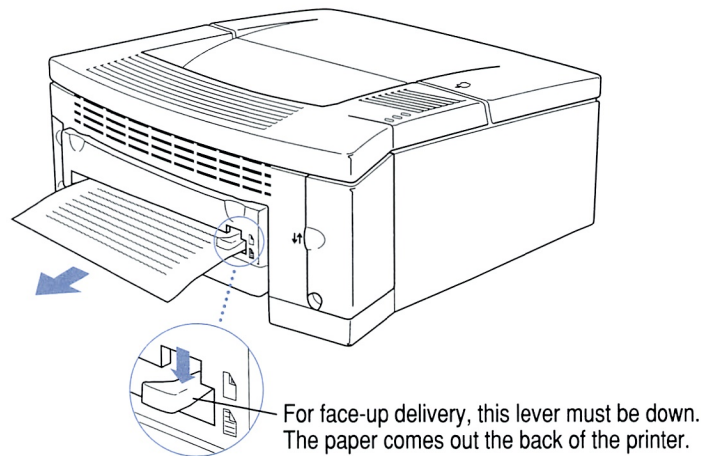
Choosing face-down or face-up delivery

You must choose where the paper comes out after it's printed.

Face-down delivery You can choose face-down delivery only with copier-weight bond paper. Face-down delivery has the advantage of keeping the paper stacked in order. The face-down tray holds at least 25 sheets. To select face-down delivery, set the paper delivery lever in the *up* position.

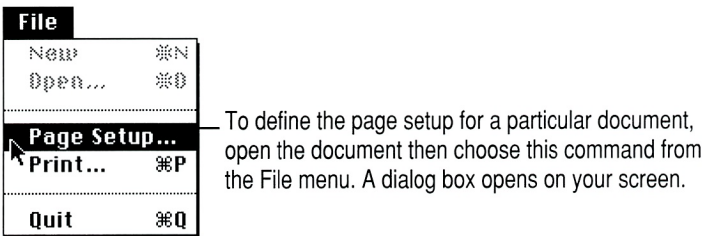


Face-up delivery Choose face-up delivery to print envelopes, transparencies, labels, and thick papers. To select face-up delivery, make sure there is enough space behind the printer for the paper to come out, and set the paper delivery lever in the *down* position.

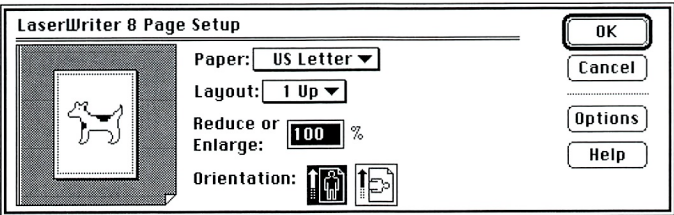


Defining the page setup

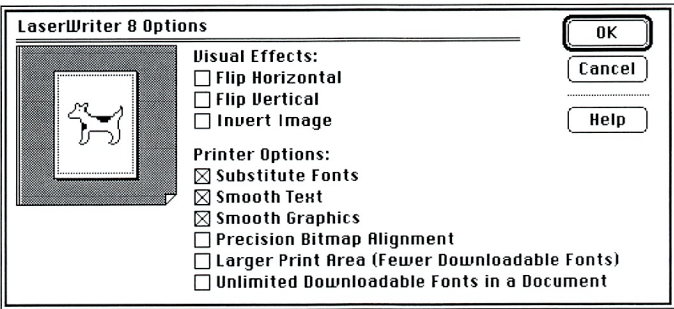
Almost every Macintosh program has a Page Setup command in the File menu which you can use to set a variety of options, from changing the paper size to applying visual effects. The most common options are already selected for you, so you need to choose Page Setup only if you want to change them.



Your program may offer options in addition to the ones shown here:



Click the Help button for information about your choices. Click the Options button to see these additional choices:



Printing a document

The Personal LaserWriter 320 prints your document using paper from the paper cassette or from the manual feed slot—whichever option is selected when you print. For instructions on selecting and using the manual feed option, see “Printing Paper or Envelopes With the Manual Feed Slot,” later in this chapter.

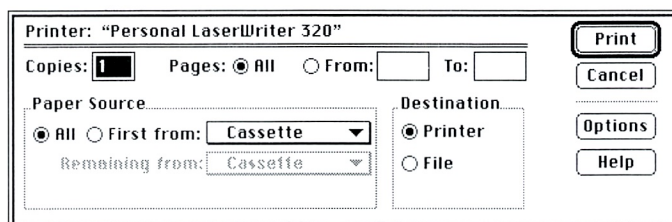
Before you begin Set the paper selector as explained in “Choosing Face-Down or Face-Up Delivery,” earlier in this chapter.

- 1 **Open the document you want to print or select its icon in the Macintosh Finder.**
- 2 **Choose Print from the File menu.**

A dialog box opens with a number of printing options.

- 3 **Set any options you like.**

The most common options are already set for you. Click Help for a description of the different parts of the dialog box. Click Options for more choices.



Note You can find many other options in the Page Setup command, also under the File menu. For details, see “Defining the Page Setup” earlier in this chapter.

- 4 **Click the Print button.**

After a moment, the green light begins to blink. Then you hear the fan come on. There is a brief wait before printing.

Printing complex documents

The more complex a document is, the more memory the Personal LaserWriter 320 needs to print it. A complex document is one that uses many different fonts that aren't built into the printer. If you print a document too complex for the amount of memory your printer has, you'll get a message saying you have a PostScript error and the document won't print.

Sometimes you can solve the problem by turning on the Unlimited Downloadable Fonts feature in the Page Setup Options dialog box. If that doesn't work, you can try using only built-in fonts. For a list of those fonts, see Appendix B, "Built-in Fonts." You can also try simplifying any pictures you have in your document.

If you print complex documents often, you may want to purchase a memory upgrade for the Personal LaserWriter 320. The printer comes with a minimum of 2 MB of memory. You can upgrade to 4 MB or 8 MB. (You can tell how much memory your printer has by printing the startup page. To print the startup page, unplug the printer, wait a moment, then plug it in again.)

Printing a document with FinePrint or Photograde

Every Personal LaserWriter 320 printer includes FinePrint, a feature that smoothes out jagged lines and curves.

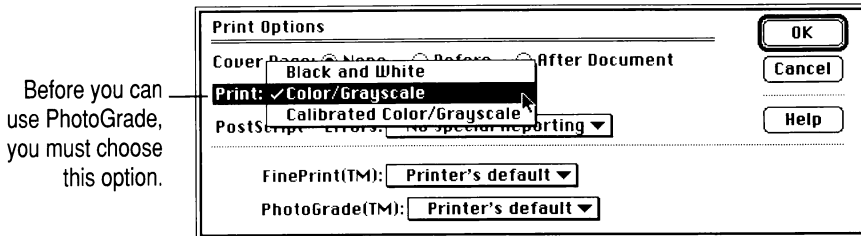
If you install the 6 MB memory upgrade (giving the printer a total of 8 MB of memory), you can also take advantage of the PhotoGrade feature to increase the number of levels of gray in your images. More levels of gray produce a more natural-looking, photographic quality. However, because printing more levels of gray requires the printer to use larger, more noticeable dots, the resolution (sharpness) of the image decreases. You can experiment with various settings to find the balance between resolution and levels of gray that suits your needs, as described in "Adjusting FinePrint and PhotoGrade" (in "Using the LaserWriter Utility Program") later in this chapter.

To turn FinePrint or PhotoGrade on and off, follow these steps:

- 1 Choose Print from the File menu.**

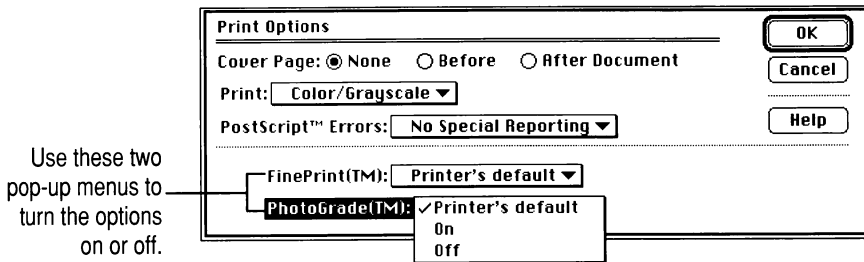
The Print dialog box appears.

- 2 Select the options you want.
- 3 Click Options to open the Print Options dialog box.
- 4 If you want to turn on PhotoGrade, choose Color/Grayscale from the PhotoGrade pop-up menu.



- 5 Choose the settings you want from the FinePrint or the PhotoGrade pop-up menu.

Remember, you can use PhotoGrade only if your printer has 8 MB of memory. Otherwise, the pop-up menu is dimmed.



What does “Printer’s default” mean? A *default* is the setting you get if you don’t change anything. In this case, it can mean either on or off, depending on how you set the default in the LaserWriter Utility program. See “Adjusting FinePrint and PhotoGrade” (in “Using the LaserWriter Utility Program”) later in this chapter to learn how to set the default.

- 6 Click OK.
- 7 Click Print.

Printing paper or envelopes with the manual feed slot

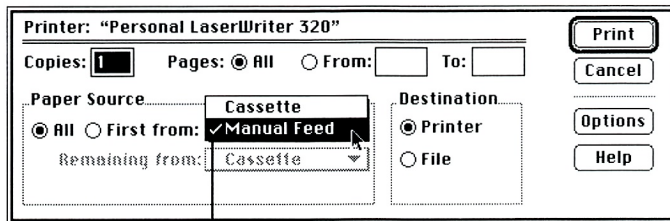
If you want to use paper that is different from what's already in the paper cassette, you can use the manual feed slot to insert sheets one at a time as the document is printed. You can also use the slot to print envelopes, heavier paper, or paper of nonstandard sizes.

Note If you are printing envelopes, choose an envelope paper size from the Page Setup dialog box. The manuals for the program from which you print envelopes may offer advice on adjusting margins to line up the address on different kinds of envelopes.

- 1 **Open the document you want to print or select its icon in the Macintosh Finder.**
- 2 **Choose Print from the File menu.**

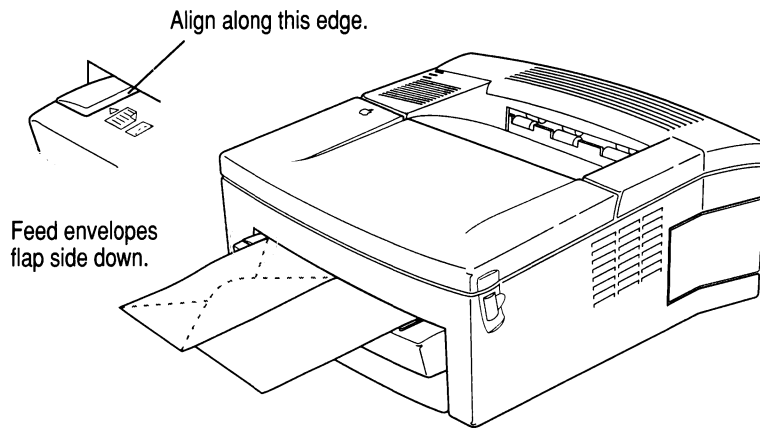
The print dialog box opens.

- 3 **Choose Manual Feed from the Paper Source pop-up menu.**



Choose Manual Feed from this pop-up menu.

- 4 Insert a sheet of paper or envelope as shown. Be sure to keep the paper straight so it feeds correctly.**



- 5 Click Print.**

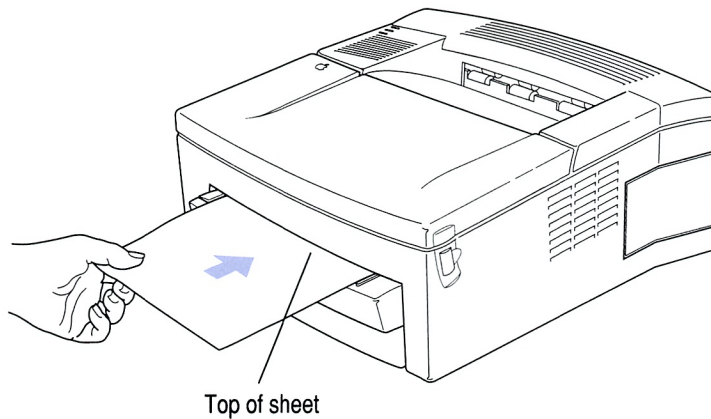
The sheet or envelope you inserted is printed. If the document has additional pages, a message on your screen will alert you each time a new sheet or envelope is needed. To avoid paper jams, always wait for the prompt before inserting a new sheet or envelope.

Printing on both sides of a page

Follow these steps to print a two-page document using both sides of the paper.

- 1 Print the first side of the page using manual feed or the paper cassette.**
- 2 Take out the printed sheet and turn it over so the printed side is up and the top of the page is nearest the manual feed slot.**
- 3 Print the second side using manual feed.**

Always use manual feed for printing the second side. To avoid jams, don't load already printed pages into the paper cassette.



Using the LaserWriter Utility program

The LaserWriter Utility program allows you to control various aspects of the Personal LaserWriter 320. You can use the program with other LaserWriter printers as well, but depending on the capabilities of the printer model, it may not perform the same functions. Before you can use the LaserWriter Utility program, you must install it, as described in the next section.

Use the LaserWriter Utility with the Personal LaserWriter 320 to

- name the printer
- turn the startup page feature on and off
- display a list of fonts built into the printer or downloaded to it
- print a list of fonts built into the printer or downloaded to it
- print samples of fonts built into the printer or downloaded to it
- download fonts to the printer
- send PostScript files to the printer
- restart the printer
- adjust FinePrint and PhotoGrade
- set the print density (to lighten or darken printing)
- see how many pages have been printed
- set the default paper size

Before you can use the program for the first time, you must install it as described in the next section.

Installing the LaserWriter Utility program

You must use the Installer program to install the LaserWriter Utility onto your hard disk. The Installer places a copy of the LaserWriter Utility in your System Folder.

- 1 **Insert the *Personal LaserWriter 320 Installation* disk into a floppy disk drive.**

The disk icon appears on the desktop, as shown in the next step.

- 2 **Double-click the disk icon to see what's on the disk.**



- 3 **Double-click the Installer icon to start the Installer program.**

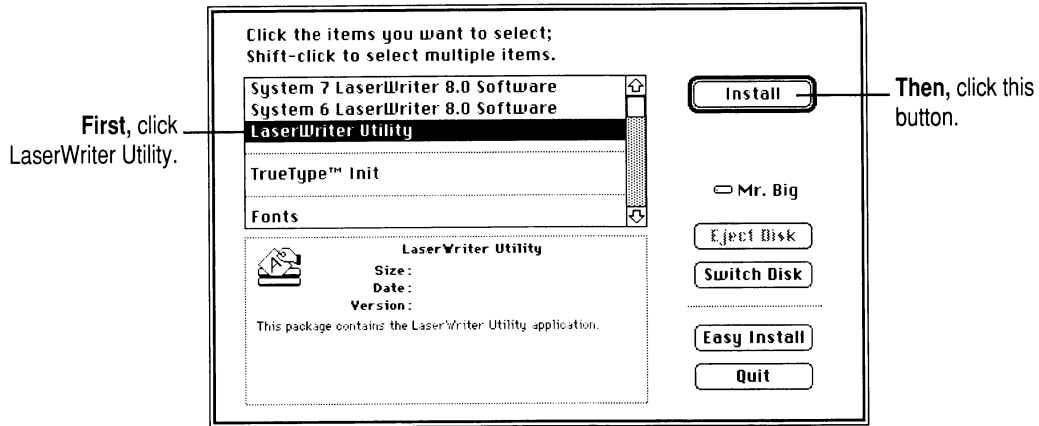


After a moment, the Installer displays information about what will be installed.

- 4 **After you read the information on the screen, click OK.**
- 5 **Click the Customize button.**



6 Ask to install the LaserWriter Utility program as shown here:



Watch the progress and follow any instructions on your screen.

7 When the installation is finished, click the Restart button.



The LaserWriter Utility program is now in your System Folder.

Naming the printer

You can give your Personal LaserWriter its own name. When it comes from the factory, it's automatically named Personal LaserWriter 320.

- 1 Open the LaserWriter Utility program.**
- 2 Choose the Name Printer command from the Utilities menu.**

A dialog box appears with the selected printer's current name.

- 3 Type the new name.**

Note If you use a character that isn't a letter or number, like an asterisk, it may look different when printed on the startup page.

- 4 Click Rename.**

A message alerts you to select the printer's new name in the Chooser. You can't print or use other LaserWriter Utility functions until you do so. See "Telling Your Macintosh to Use the Personal LaserWriter 320" in Chapter 1.

- 5 Click OK.**

If other people use your printer, make sure you tell them the new name.

Turning the startup page feature on or off

The Personal LaserWriter 320 is usually set to print a page when you plug it in. This startup page shows the printer's name, the total number of pages printed, the amount of memory, the number of built-in fonts, and the communication settings. You can turn this feature off if you wish.

- 1 Open the LaserWriter Utility program.**
- 2 Choose Set Startup Page from the Utilities menu.**

A dialog box appears that allows you to turn the startup page on or off.

- 3 Click On or Off.**
- 4 Click OK.**

Displaying a list of printer fonts

You can view a list of the fonts currently stored in the printer's memory.

- 1 **Open the LaserWriter Utility program.**
- 2 **Choose Display Available Fonts from the File menu.**
- 3 **Click the close box when you are finished viewing the list.**

Printing a list of printer fonts

You can print a list of the fonts currently stored in the printer's memory.

- 1 **Open the LaserWriter Utility program.**
- 2 **Choose Print Font Catalog from the File menu.**

The Print dialog box is displayed.

- 3 **Click Print.**

Printing samples of printer fonts

You can print samples of the fonts currently stored in the printer's memory.

- 1 **Open the LaserWriter Utility program.**
- 2 **Choose Print Font Samples from the File menu.**

The Print dialog box is displayed.

- 3 **Click Print.**

Downloading fonts to the printer

You can download additional fonts to the printer. You don't have to download fonts to use them in printed documents, but doing so can make printing faster than storing fonts only on your computer. All fonts you download to the printer's memory will be deleted when you turn off your printer.

- 1 Open the LaserWriter Utility program.**
- 2 Choose Download Fonts from the File menu.**
- 3 Click the Printer button to download fonts to the printer.**
- 4 Click Add.**

A dialog box appears.

- 5 Select the fonts you want to download.**

Double-click the font name in the list, or select the name and click Add. If you change your mind about any font you've added to the list, select the font and click Remove.

- 6 Click Done when you have finished selecting fonts.**
- 7 Click Download.**

A dialog box informs you of progress and tells you when downloading is completed.

- 8 Click OK.**

Sending PostScript files to the printer

Many programs allow you to save an image as a Postscript or Encapsulated PostScript (EPS) file. In addition, you can save any printable information as a PostScript file by clicking the File button in the Print dialog box. You can also obtain special PostScript programs to change internal LaserWriter settings. You can send any PostScript file or program to the printer by following these steps:

- 1 Open the LaserWriter Utility program.**
- 2 Choose Download PostScript File from the Utilities menu.**

A dialog box appears in which you can select the file.

3 Click the file you wish to download.

4 Click Open.

A second dialog box appears, in which you indicate where on your disk to save any PostScript response from the printer.

5 Select a folder in which to save the PostScript log file.

You can type a new name for the file if you wish.

6 Click OK.

The file is downloaded to the Personal LaserWriter 320, and any PostScript response from the printer is saved on your disk.

Restarting the printer

You may need to restart the printer to clear its memory if you have problems printing. Chapter 4, “Tips and Troubleshooting,” describes when this may be necessary.

1 Open the LaserWriter Utility program.

2 Choose Restart Printer from the Utilities menu.

A dialog box appears asking you to confirm that you want to restart the selected printer.

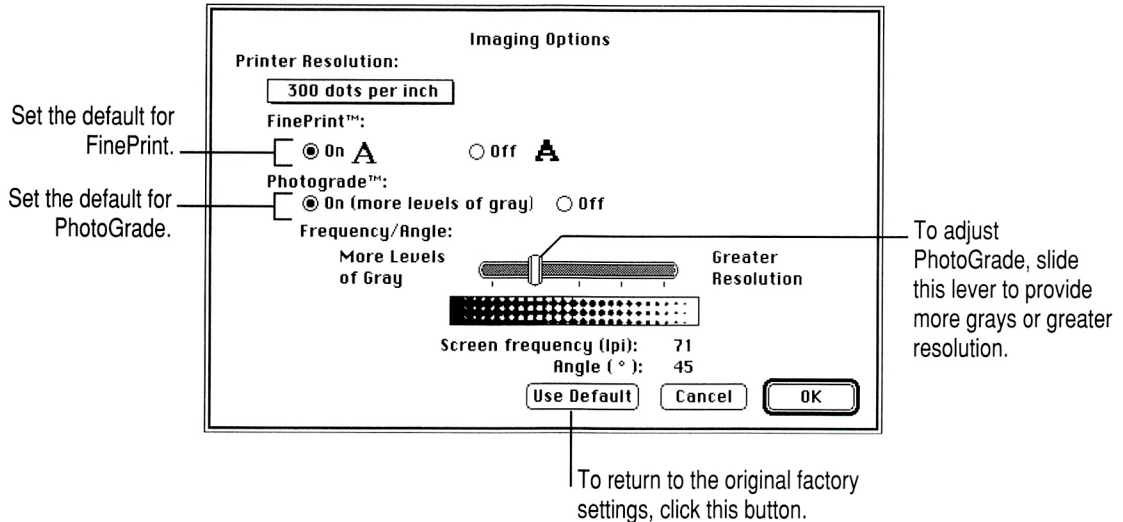
3 Click Restart.

It takes a few minutes for the printer to restart and be ready to print.

IMPORTANT Make sure no one is attempting to use the printer before you restart it.

Adjusting FinePrint and PhotoGrade

- 1 Open the LaserWriter Utility program.
- 2 Choose Imaging Options from the Utilities menu.
- 3 Set the defaults for the FinePrint and PhotoGrade or adjust PhotoGrade as you like.



Note You turn PhotoGrade and FinePrint on or off in the Print Options dialog box (as explained in “Printing a Document With FinePrint or PhotoGrade” earlier in this chapter). The on or off settings in the Imaging Options dialog box shown here determine the *default* for the features—whether they should normally be on or off. Even if its default is set to on, you can still turn PhotoGrade or FinePrint off for a particular document in the Print Options dialog box. Likewise, if its default is set to off, you can still turn PhotoGrade or FinePrint on for a particular document in the Print Options dialog box.

- 4 When you're finished, click OK.

Setting the print density

You use the print density control to adjust the darkness of the printer's output.

- 1 **Open the LaserWriter Utility program.**
- 2 **Choose Print Density from the Utilities menu.**

The Print Density dialog box appears.

- 3 **Drag the slider right or left to increase or decrease the print density.**
- 4 **Click OK.**

Seeing how many pages have been printed

The Personal LaserWriter 320 stores a running total of the number of pages it has printed. You can display the current page count as follows:

- 1 **Open the LaserWriter Utility program.**
- 2 **Choose Get Page Count from the Utilities menu.**

A dialog box appears with the current page count of the selected printer.

- 3 **Click OK when you are finished viewing.**

Setting the default paper size

When you set up the Personal LaserWriter 320, its default paper size is U.S. Letter. That means you must use the Page Setup command to indicate a different size whenever you print using different sized paper. If you usually use a different paper size, you can change the default by following these steps:

- 1 **Open the LaserWriter Utility program.**
- 2 **Choose Paper Handling from the Utilities menu.**

Choose the default size from Paper Tray pop-up menu.

- 3 **Click OK.**

3

Maintaining Your Printer



This chapter describes the few things you need to do to maintain your printer.

In this chapter

- Replacing the toner cartridge
- Cleaning the exterior

Replacing the toner cartridge

Toner is the powdered ink that produces the image on the paper. When the LaserWriter starts printing lighter than it usually does, it's probably time to replace the toner cartridge, though you might want to try adjusting the print density first (as explained in “Setting the Print Density” in “Using the LaserWriter Utility Program” in Chapter 2).

To replace the toner cartridge, follow the instructions in “Installing the Toner Cartridge” in Chapter 1.

Cleaning the exterior

Before you clean the Laserwriter, unplug the power cord. Then wipe the exterior with a clean, soft damp cloth. Use a mild soap or detergent if necessary, but never ammonia-based or alcohol-based cleaners. Be careful not to get any liquid in any of the receptacles.

WARNING Don't use ammonia-based or alcohol-based cleaners on or around the printer. Ammonia can react with the toner and alcohol can hurt the plastic case.

4

Tips and Troubleshooting



This chapter provides solutions to printing problems you may encounter while using your printer.

WARNING If you have a problem with your printer and nothing presented in this chapter solves it, see the service and support information that came with your printer or computer. If you attempt to repair the printer yourself, any damage you may cause to the printer will not be covered by the limited warranty.

In this chapter

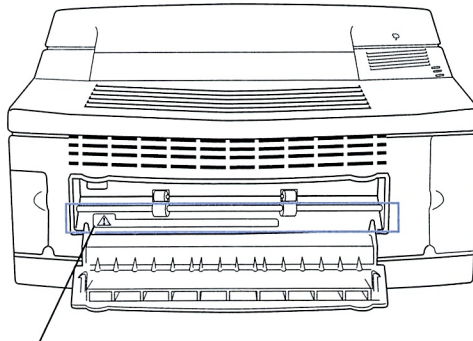
- Safety precautions
- Checking the printer's status lights
- Solving some common problems
- About paper

Safety precautions

Consider these rules of safety before you open the printer or attempt to troubleshoot problems:

- Don't attempt to disassemble the printer.
- Don't use oil inside the printer.
- Don't use ammonia-based cleaners on or around the printer. They may react with the toner.
- Don't use alcohol-based cleaners on or around the printer. They may react with the plastic case.
- Don't leave the access door open. Exposing the toner cartridge to light may damage the cartridge.
- Don't open the drum-protection shutter on the toner cartridge.
- Be sure the power cord is within easy reach, should you want to unplug the printer at any time. Since the Personal LaserWriter 320 has no power switch, unplugging it is the only way to turn it off.
- Never try to defeat the interlock switches inside the printer.

IMPORTANT The fixing assembly in the printer operates at very high temperatures. When you open the printer, don't touch the fixing assembly.

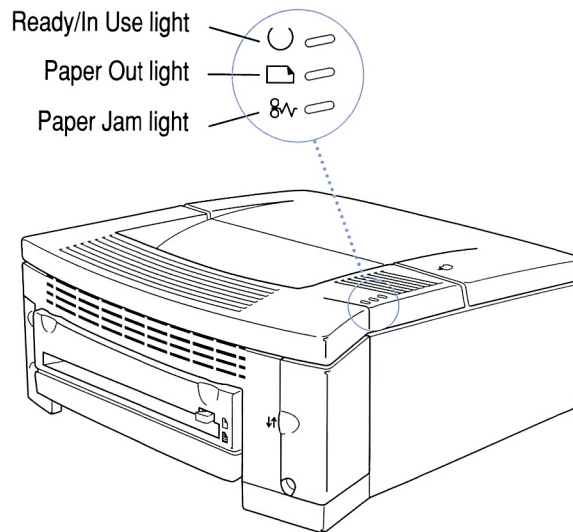


Fixing assembly
(This area gets very hot.)

Some odor from the heat of the printing process is normal.

Checking the printer's status lights

Always check the status lights first when a printing problem occurs. These often tell you the cause of the problem.

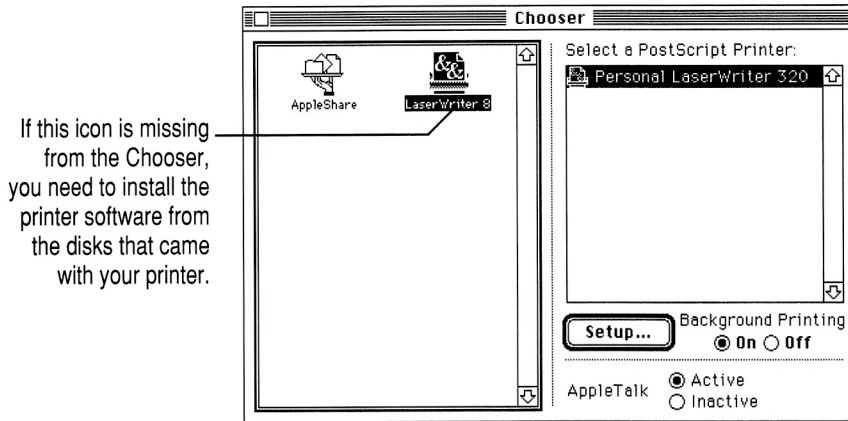


- *The green Ready/In Use light* glows steadily whenever the printer is plugged in, and blinks when it is printing.
- *The amber Paper Out light* glows steadily when there is no paper in the cassette or the paper cassette is removed, and blinks when the printer is waiting for manual feed.
- *The amber Paper Jam light* glows steadily when any obstruction occurs in the paper path.

If both the Paper Out and Paper Jam lights flash or glow at the same time, the printer requires service.

Solving some common problems

The Chooser doesn't show the LaserWriter 320 icon



If this icon is missing from the Chooser, you need to install the printer software from the disks that came with your printer.

To install the printer software, follow the instructions in Chapter 1. Make sure you select the printer in the Chooser.

The Macintosh can't find the printer

If you have selected the printer icon in the Chooser but nothing prints or you get a message that no printer has been found, one of the following may be the cause:

- The printer has been unplugged. Make sure it is plugged securely into an outlet (the green status light should be on).
- In the Chooser, you may have chosen the wrong printer. Select the correct Chooser options as described in “Telling Your Macintosh to Use the Personal LaserWriter 320” in Chapter 1.
- One of the connection cables is loose. Check to make sure that all the cables between your computer and the printer are secure. See Chapter 1.

If you still can't resolve the problem, the printer may not be functioning properly. Contact an Apple-authorized service provider about repairs.

The pages print on the wrong Personal LaserWriter 320

If you have more than one Personal LaserWriter 320 connected to your network, make sure you have the correct one selected in the Chooser (See “Telling Your Macintosh to Use the Personal LaserWriter 320” in Chapter 1.)

If that doesn't solve the problem, the two printers may have the same network identification number—a problem caused by plugging in the printer before connecting it to the network. To solve the problem, identify which printers are being confused with each other, make sure both are connected to the network, unplug each from the wall, wait a moment, and plug them in again. Then select the printer you want as described in “Telling Your Macintosh to Use the Personal LaserWriter 320” in Chapter 1.

The Larger Print Area option is dimmed in the Page Setup Options dialog box

If your Personal LaserWriter 320 has only 2 MB of memory, you cannot use the Larger Print Area option.

Printing goes beyond the bottom of the page

You may have set up your document as a legal-size page in the Page Setup dialog box and loaded letter-size pages in the printer. To correct the problem, change the page setup or load different paper.

Printing takes a long time

Printing may be slow on pages containing complex graphics or pages printed using landscape (horizontal) orientation.

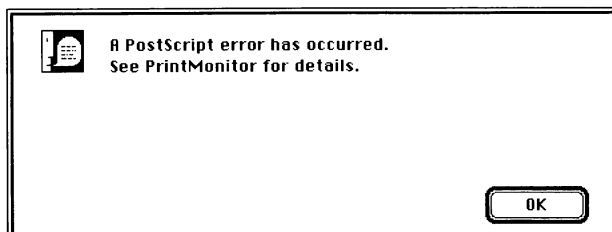
The processing speed of your computer and the amount of memory it has directly affect printing time. Using a faster computer or upgrading your printer's memory will speed up printing.

Text lines up in columns on the screen but not when it prints

You may have used spaces (rather than tabs) to line up the text. Because printers interpret spaces differently than does the screen, the text may fail to line up when you print it. Try replacing the spaces with tabs.

The printer won't print a particular page or document

If a document contains a page with a great number of different fonts or very complex graphic images, the printer may be unable to print the page and you will see this error message:



If you see this error, follow these steps:

- 1 Click OK to close the error dialog box.
 - 2 Pull down the application menu on the right side of the menu bar and choose PrintMonitor.
- PrintMonitor opens and a dialog box asks if you want to cancel or try again.
- 3 Click Cancel.
 - 4 Close PrintMonitor by choosing Close from the File menu.
 - 5 Return to the document you're trying to print and try the following:
 - Select Unlimited Downloadable Fonts in the Options area of Page Setup.
 - Reduce the number of fonts you need to download by using only fonts built into the printer. For a list of such fonts, see Appendix B, "Built-in Fonts."
 - Simplify complex drawings.
 - Do *not* select Use Larger Print Area in the Options area of Page Setup.
 - Use a smaller paper size. You are most likely to experience this problem when printing legal-size documents.
 - Add more memory to your printer.

The page prints differently on different printers

Try the following:

- Make sure you have the same fonts and printer software on each computer you print from.
- Don't use "Larger Print Area" option in Page Setup. The large page sizes are not standard from printer to printer.
- Use tabs and margins (rather than spaces) to line up your text.

Type looks jagged or some text changes to the Courier or Geneva font

The most likely cause of this problem is that you are using a bitmapped font instead of an outline font.

TrueType and PostScript fonts are outline fonts. A character from an outline font can be printed smoothly in any size you specify. Your Personal LaserWriter 320 comes with a set of outline fonts.

Bitmapped fonts are fixed in shape and size. Your printer can produce smooth bitmapped characters only in the sizes for which it has instructions (a map of dots for each font size). If you use a bitmapped font in a size for which your printer does not have instructions, your system tries to create the size you want. The resulting characters can look jagged. Even a font that looks good on your screen can look bad when printed.

The best solution to this problem is to switch to an outline font. All the fonts shipped with this printer are outline fonts. (For a list of these fonts, see Appendix B.) For more information about outline fonts, see the books that came with your Macintosh.

When your computer runs low on memory, TrueType turns itself off and some TrueType fonts may be displayed and printed in the Geneva font. If you've installed bitmapped versions of your TrueType fonts, they will not change to Geneva, but they will look very jagged when TrueType is turned off.

The printer prints on only part of the paper

Make sure you have selected the appropriate paper size in the Page Setup dialog box.

Check the adjustment of the sliding backstop in the paper cassette to make sure it is correct for your paper size. See “Putting in Paper” in Chapter 1.

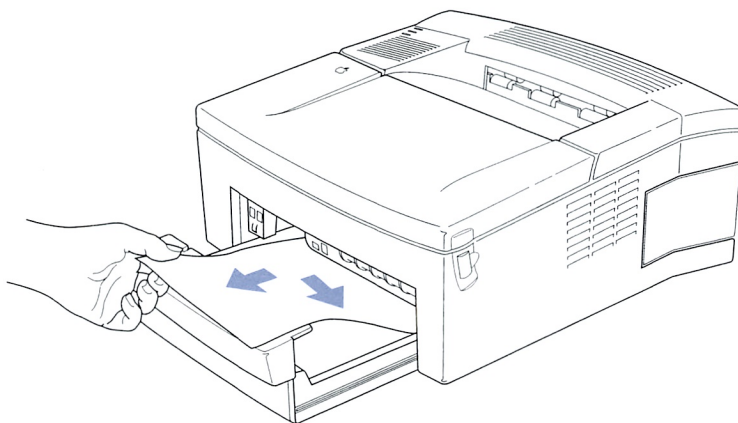
Paper is jammed

To avoid paper jams, make sure that the paper size indicated in the Page Setup dialog box matches the actual paper size, that the paper cassette is properly loaded, that you use only recommended paper types (see “About Paper” later in this chapter for advice on choosing paper), and if you are using manual feed, that you wait for the prompt before inserting a new sheet. Also, before plugging the printer in for the first time, make sure you have installed A4 or Letter size paper. Paper jams are sometimes caused by moving or jarring the printer.

If the Paper Jam light is on, follow these steps in order until the Paper Jam light goes off:

1 Remove the paper cassette.

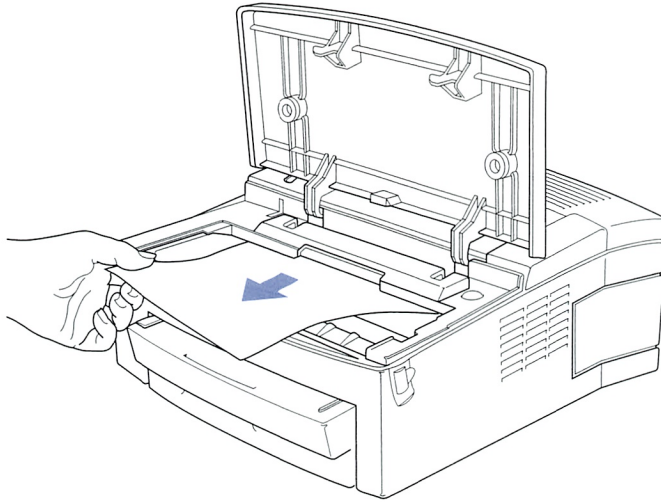
Be sure the paper is loaded correctly in the paper cassette. The stack of paper should fit under the corner brackets. With the paper cassette removed, look inside the printer and remove any jammed sheets you see.



Replace the paper cassette.

2 Open the printer and remove the toner cartridge.

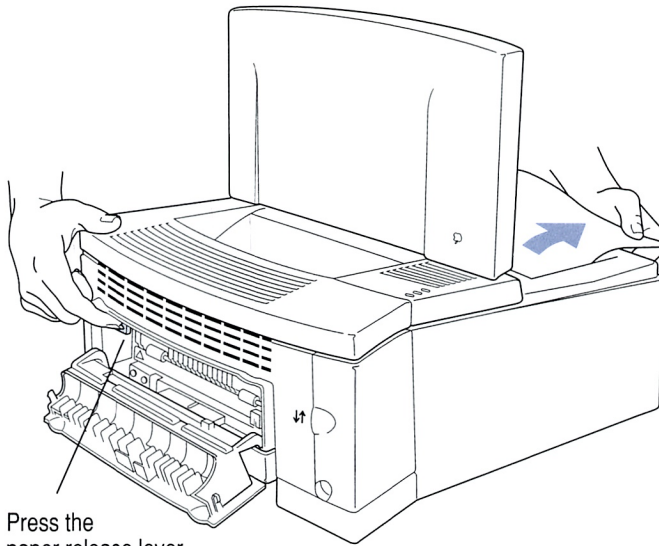
With the toner cartridge out of the way, remove any jammed sheets you see. Pull the sheets straight out. Avoid pulling at an angle that might tear the paper and leave scraps inside the printer.



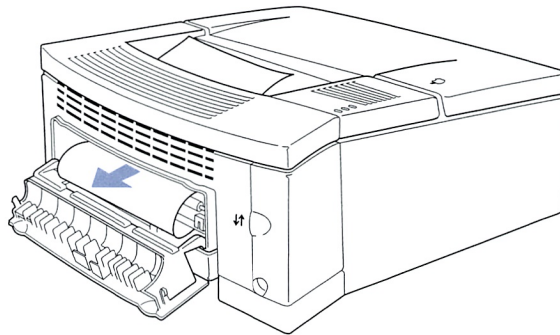
Replace the toner cartridge when you're finished.

- 3 **Open the printer's back door as shown below. Press the paper release lever and pull the jammed sheets out through the front.**

This type of jam is often caused by an interruption in printing.



- 4 **If paper is wrapped around the roller, pull it down and out.**



Unwanted lines or stripes appear

If white or dark lines appear on the page, remove the toner cartridge and rock it to redistribute the toner. Be sure to hold the cartridge horizontally.

Paper feeds improperly

If paper tears, gets skewed, or comes through the printer crumpled, it may not be entering the printer properly.

Remove any jammed sheets from inside the printer. Remove the paper cassette, turn the stack of paper over, and replace the cassette. (Most paper has one side that prints better.) It may also help to fan the edge of the stack with your thumb, in case some of the sheets are stuck together.

Make sure the stack of paper is loaded correctly into the paper cassette, and fits under all the corner brackets.

Some papers cause jams because they are not intended for use with laser printers. See “About Paper,” later in this chapter, for advice on choosing papers.

Toner stains appear on printed pages

If the printed pages are not clean, there may be a buildup of toner on the printing rollers. If stains appear on the backs of printed pages, you may have printed an image that is larger than the paper, causing toner to be deposited in the paper path.

To clean the rollers, print several blank pages until the stains disappear. (You can use any word processing program to print blank pages. Just open a new file and print it.)

The image is too light or too dark

If printing is too light or too dark, try the following:

- Take out the toner cartridge and rock it gently to distribute toner. If this doesn't help, you may need to replace the cartridge. See “Installing a Toner Cartridge” in Chapter 1 for instructions.
- Adjust the print density, as described in “Using the LaserWriter Utility Program” in Chapter 2.
- Try using a fresh package of paper. If the problem occurs on paper other than standard copier-weight bond, the toner may not adhere well to the paper you are using. For advice on choosing paper for your laser printer, see “About Paper,” next.

About paper

Many problems (such as toner smearing, paper curling, or improper paper feeding) can be caused by the paper you are using. To assure good results, use only paper, envelopes, and transparencies that are manufactured for use with laser printers and photocopy machines.

Make sure any paper you use is free of rips, wrinkles, dust, and oil stains. Paper with cutouts or perforations is not recommended.

Here is a list of papers to avoid:

- extremely slick or shiny paper
- erasable typewriter paper
- paper that is highly textured
- coated paper
- stapled paper
- envelopes that contain fasteners or snaps
- multipart forms

WARNING Do not use paper printed using low-temperature dyes or thermography. Such materials can peel away from the paper or melt inside the LaserWriter and cause damage. Colored paper can be used as long as the color is added during the paper-making process, not after, and the color can withstand the heat generated by the printer's fixing assembly (approximately 190° C or 374° F). Envelopes, transparencies, and labels are acceptable as long as they contain no fasteners and can withstand the heat generated by the fixing assembly.

The paper cassette can hold up to 100 sheets of U.S. Letter, A4, B5, U.S. Legal, and Executive paper.



Appendix A

Upgrading Your Printer's Memory

.....

Upgrading the memory in your Personal LaserWriter 320 has many benefits:

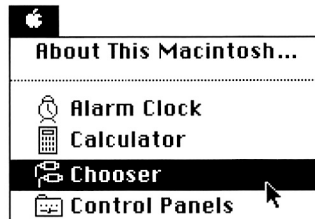
- It allows you to print documents that are more complex.
- It may speed up the printing of complex documents.
- It enables the use of PhotoGrade for more lifelike images (with a total of 8 MB of printer memory).

To purchase and install a memory upgrade for your printer, see your Apple-authorized dealer.

WARNING To avoid damage to your printer, Apple Computer recommends that only an authorized Apple-certified technician install additional RAM. Consult the service and support information that came with your Apple product for instructions on how to contact an Apple-authorized service provider or Apple for assistance. If you attempt to install additional RAM yourself, any damage you may cause to your equipment will not be covered by the limited warranty on your printer. See an Apple-authorized dealer or service provider for additional information about this or any other warranty question.

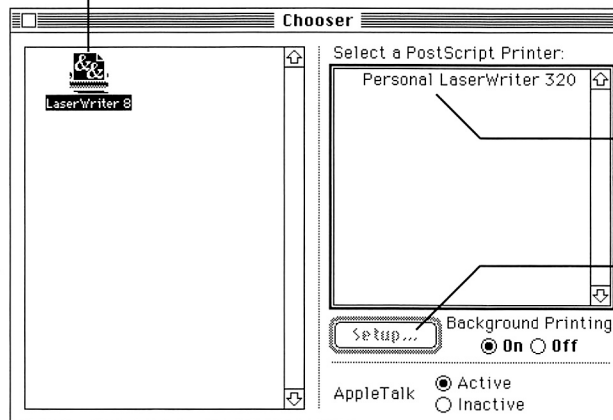
Once the upgrade is installed, you must tell your Macintosh that you have increased the printer's memory, as follows:

- 1 Open the Chooser by pulling down the Apple () menu and selecting Chooser.



- 2 Click items in the Chooser as follows:

First, click the LaserWriter 8 icon. (If you don't see it, click the scroll arrows. There may be a number of other icons here.) After a moment, your printer's name appears in the box to the right.



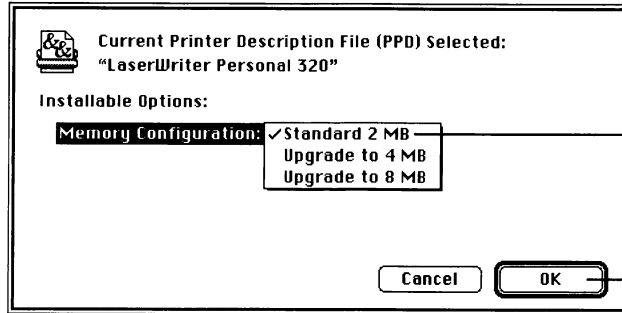
Second, click "Personal LaserWriter 320."

Third, click the Setup button, which opens the Setup dialog box.

- 3 In the Setup dialog box, click Auto Setup.

The Macintosh displays messages on your screen while it selects the correct PostScript Printer Description (PPD) file for your model of LaserWriter.

- 4 If the Setup dialog box has only four buttons, click More Choices to see the rest of the buttons.
- 5 Click Configure to see the Installable Options dialog box.
- 6 In the Installable Options dialog box, indicate which upgrade you have installed.



First, use this pop-up menu to indicate the total amount of memory in your printer.

Then, click OK to close this dialog box.

- 7 Click OK to return to the Chooser.
- 8 Close the Chooser by clicking its close box (in the top-left corner).



Appendix C

Technical information

.....

Specifications

Print quality

- PostScript, 300 dots per inch for text and graphics
- Available: Apple's FinePrint (standard) and PhotoGrade (with memory upgrade)

Printer memory

- Two megabytes (MB) of random-access memory (RAM)
- Can be upgraded to 4 MB or 8 MB

Printer fonts

- 35 fonts, listed in Appendix B, are built in. The Personal LaserWriter 320 can support additional fonts from Apple and from other suppliers.

Speed

- Four pages per minute maximum. Actual speed depends on the images printed and the computer used.

Interface

- LocalTalk port for connection to an AppleTalk network

Life expectancy

- Minimum life expectancy is 150,000 pages, with no monthly page limit.

Paper feed

- Automatic feed from paper cassette; manual feed for envelopes or single sheets

Energy Star

- The Personal LaserWriter 320 is EPA-Energy-Star-compliant.

Printing materials

Apple recommends 20-pound photocopy bond (75 grams/meter²). You can use 16-pound (64 g/m²) to 28-pound (105 g/m²) paper with manual feed; the paper cassette accepts 16-pound (64 g/m²) to 24-pound (90 g/m²) paper. Accepts most letterhead and colored stock, and medium-weight laser printer transparencies. Print labels using manual feed. Use envelopes recommended for laser printers. Print envelopes, transparencies, and other special media using manual feed and face-up delivery.

Paper sizes and capacity

The paper cassette can hold up to 100 sheets of U.S. Letter, U.S. Legal, A4, B5, and Executive paper sizes.

Imageable area

Measured in millimeters (mm) and inches (in.):

- Maximum printable line: 208.534 mm (8.21 in.)
- Minimum top margin: 2.794 mm (0.11 in.)
- Minimum bottom margin: 5.080 mm (0.20 in.)
- Minimum left margin: 3.302 mm (0.13 in.)
- Minimum right margin: 4.064 mm (0.16 in.)

Actual imageable area may vary depending on the application program.

Dimensions

Measured in centimeters (cm) and inches (in.):

- Height: 16.1 cm (6.3 in.)
- Width: 38.5 cm (15.2 in.)
- Depth: 37.9 cm (14.9 in.)

Weight

- 7 kilograms (15.4 pounds) not including cartridge

Operating environment

Temperature

- 50° to 90.5° Fahrenheit (10° to 32.5° Celsius)

Humidity

- 20 to 80 percent, noncondensing

Toner cartridge storage environment

- 32° to 95° Fahrenheit (0° to 35° Celsius)

Input electrical requirements

U.S./Japan

- 100–120 volts ± 10 percent
50–60 hertz ± 2 hertz

Europe/Australia

- 220–240 volts ± 10 percent
50 hertz ± 2 hertz

Power consumption

Operating

- 180 watts average at 115 volts or 220 volts

Standby

- less than 10 watts

Maximum input current

- 3.6 amperes at 120 volts
- 1.8 amperes at 220 volts

Ozone emission

- Less than 0.05 parts per million maximum, measured in accordance with European Computer Manufacturers Association (ECMA 129) or Underwriters Laboratories (UL 114) standards for ozone density measurement

Laser Specifications

- Type: Anode Common Type
- Wavelength: 775–795 nanometers
- Output power: 5 milliwatts



Index

A

- A4 paper, for startup page 11, 14
- Apple Peripheral-8 cable 5
- AppleTalk network, connecting printer on 6

B

- Backgrounder, System 6 and 15
- bitmapped font, outline font vs. 47
- both sides of page, printing on 30
- bottom of page, printing past 45
- built-in fonts, listed 57

C

- cassette, loading with paper 10–12
- Chooser
 - LaserWriter 320 icon missing from 44
 - selecting printer in 17–18
- cleaning the printer 3, 40
- cleaning printing rollers 51

- colored paper 52, 60
- columns not lined up 45
- complex document
 - printing 25
 - unable to print message 46
- connecting the printer
 - on an AppleTalk network 6
 - directly to a Macintosh 5
- copier-weight bond paper, face-down delivery for 22
- Courier font, problems with 47

D

- defaults, defined 26
- dimensions of printer 61
- disconnecting the printer 13
- disk with printer software 15, 31
- documents
 - complex 25
 - printing 24–26
 - printing with FinePrint or Photograde 25–26
- downloading fonts to printer 35

E

- Encapsulated PostScript (EPS) files,
 - sending to printer 35–36
- electrical consumption 62
- electrical requirements 61
- energy conservation feature 2, 13
- Energy Star compliance 60
- envelopes
 - acceptable types of 52
 - face-up delivery for 22
 - printing with manual feed 27–28
- environmental requirements 61
- EPA compliance 60

F

- face-down or face-up delivery 22
- File menu
 - Page Setup command 23
 - Print command 20, 24
- FinePrint feature 2, 25
 - adjusting 37
 - printing documents with 25–26
 - turning on or off 25–26, 37
- fixing assembly, caution about 42
- fonts
 - additional, support for 59
 - built-in, listed 57
 - complex documents and 25
 - displaying list of 34
 - downloading to printer 35
 - PostScript capabilities 2
 - printing list of 34

G

- Geneva font, jagged type or text changes
 - to 47
- grayscale images 2
 - PhotoGrade feature and 25
- grounding plug 14

H

- heavy paper, printing with manual feed
 - 27–28

I

- icons, printer port 5
- imageable area 60
- Imaging Options dialog box 37
- Installer 15, 16
- installing LaserWriter Utility program
 - 31–33
- installing printer 1–20

J, K

- jagged type 47

L

- labels, face-up delivery for 22
- Larger Print Area option, dimmed 45
- laser specifications 62
- LaserWriter 8 icon, placing in Chooser
 - 18

- LaserWriter 320, printing on wrong printer 45
- LaserWriter 320 icon, missing from Chooser 44
- LaserWriter Utility program 30–33
 - installing 31–33
- LaserWriter 8 driver, System 6 and 15
- letterhead paper 60
- letter-size paper, for startup page 11
- life expectancy of printer 60
- lights on printer 43
- lines or stripes on page 50
- loading paper 10–12
 - paper feed problems and 51
- LocalTalk cable 6
- LocalTalk connector box 6
- LocalTalk port 2
 - connecting Macintosh to 5
- location for printer 4

M

- Macintosh Chooser. *See* Chooser
- Macintosh computer, connecting to 5
- maintenance
 - cleaning the exterior 40
 - cleaning printing rollers 51
 - replacing toner cartridge 7–9, 40
 - safety precautions 3
- manual feed printing 27–28
- memory
 - clearing by restarting printer 36
 - complex document printing and 25
 - displaying or printing fonts from 34
 - Larger Print Area option and 45
 - PhotoGrade feature and 25
 - specifications 59
 - TrueType fonts and 47
 - upgrading 25, 53–55
- multiple fonts, unable to print message 46

N

- naming the printer 33
- network
 - interface 59
 - printing differently on two printers 47
 - printing on wrong printer 45

O

- operating environment 61
- outline fonts, bitmapped font vs. 47
- ozone emissions 62
 - printer location and 4

P, Q

- page count, displaying 38
- page setup
 - defining 23
 - for changing settings 19
- Page Setup Options dialog box,
 - Unlimited Downloadable Fonts feature 25
- paper
 - acceptable types of 10, 52, 60
 - face-down or face-up delivery of 22
 - jammed 48–50, 51
 - light or dark printing and 51
 - printing past bottom of 45
 - recommended types of 60
 - selecting size of 19
 - setting default size for 38
 - startup requirements 11
 - unacceptable types of 52

- paper cassette
 - capacity of 60
 - loading 10–12
- paper delivery lever 22
- Paper Jam light 43
- paper jams 48–50, 51
- Paper Out light 43
- paper size 60
 - printing on only part of page and 48
 - printing past bottom of page and 45
 - setting default 38
 - startup page 11
- Paper Source pop-up menu 27
- Peripheral-8 cable 5
- Personal LaserWriter 320 Installation
 - disk 15–16
- PhotoGrade feature 2
 - adjusting 37
 - printing with 25–26
 - turning on or off 25–26
 - turning on or off 37
- plugging in the printer 13–14
- PostScript capabilities 2
- PostScript error, complex document and 25, 46
- PostScript files
 - saving as 35
 - sending to printer 35–36
- PostScript™ fonts, as outline fonts 47
- power consumption 62
- Print command (File menu) 20, 24
- print density, setting 38
- print quality specifications 59
- printer
 - naming 33
 - sending PostScript files to 35–36
- printer fonts. *See* fonts
- printer not found message 44
- printer port icon 5
- printer software, installing 15–16
- Printer's default, defined 26
- printing 21–38
 - adjusting darkness of 51
 - both sides of page 29
 - documents 24–26
 - envelopes 27–28
 - face-down or face-up delivery 22
 - with FinePrint or PhotoGrade 25–26
 - manual feed 27–28
 - page setup for 23
 - samples of 34
 - speed of 59
 - startup page 11, 14
 - testing 19–20
 - too slowly 45
- PrintMonitor, System 6 and 15
- problems. *See* troubleshooting

R

- radio interference v
- Read Me file, printing 19–20
- Ready/In Use light 14, 43
- renaming the printer 33
- resolution, PhotoGrade feature and 25
- restarting the printer 36

S

- safety precautions vi, 3, 4
 - grounding plug 14
 - in troubleshooting 42
- sample fonts, printing 34
- setup 1–20
 - connecting printer to a Macintosh 5
 - connecting printer to a network 6
 - installing printer software 15–16
 - installing toner cartridge 7–9
 - LaserWriter Utility program 31–33
 - location options 4
 - paper loading 10–12
 - plugging in printer 13–14
 - safety precautions 3, 4
 - selecting printer in Chooser 17–18
 - trying out printer 19–20
- slow printing 45
- soft fonts, downloading 35

- software, installing 15–16
- specifications 59–62
- speed of printing 59
- standby status 2, 13
- startup page
 - memory shown on 25
 - paper size for 11
 - printing 14
 - turning on or off 33
- status lights, checking 43
- stripes on page 50
- System 6, printer software and 15
- system software, printer software and 15, 16

T

- technical information 59–62
- television interference v
- thick papers, face-up delivery for 22
- 3-hole paper, loading 12
- 3-wire grounding plug 14
- toner cartridge, installing or replacing 7–9, 40
- toner stains on printed pages 51
- total number of pages, displaying 38
- transparencies, face-up delivery for 22

- troubleshooting 41
 - columns not lining up 45
 - Courier or Geneva font problems 47
 - image too light or dark 51
 - jagged type 47
 - Larger Print Area option dimmed 45
 - LaserWriter 320 icon not in Chooser 44
 - lines or stripes on page 50
 - paper feed problems 51
 - paper jams 48–50, 51
 - printer won't print particular page or document 46
 - printing differently on two printers 47
 - printing on only part of paper 48
 - printing past bottom of page 45
 - printing on wrong LaserWriter 320 45
 - slow printing 45
 - status lights 43
 - toner stains on printed pages 51
- TrueType fonts, as outline fonts 47
- trying out the printer 19–20
- turning on the printer 13–14

U, V

- Unlimited Downloadable Fonts feature, complex documents and 25
- upgrading memory 25
- utility program. *See* LaserWriter Utility program

W, X, Y, Z

- “waking up” to full power 13
- warranty
 - caution about 41
 - memory upgrade and 53
- weight of printer 61

The Apple Publishing System

This Apple manual was written, edited, and produced on a desktop publishing system using Apple Macintosh computers and QuarkXPress. Technical illustrations were drawn in Adobe™ Illustrator; screen shots were created and modified with system software, Exposure Pro, Aldus SuperPaint, and Adobe Photoshop. Proof pages were created on Apple LaserWriter printers and on QMS and Tektronix color printers. Final pages were output directly to separated film on a PostScript-driven imagesetter.

Text type is Times, display type is Helvetica Narrow, and cover type is Apple Garamond, Apple's corporate font. Ornaments are custom symbols designed for Apple Computer. Some elements, such as computer voice, are set in Apple Courier, a fixed-width font.

PostScript, the LaserWriter page-description language, was developed by Adobe Systems Incorporated.



Apple Computer, Inc.

20525 Mariani Avenue

Cupertino, California 95014-6299

408.996.1010

TLX 171-576

030-4796-A

Printed in U.S.A.